Identifying the Direction of Catalytic Research Performed in 2008 by Data Mining of Papers in ISI Database

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Abstract
To have an effective contribution in any scientific field, one should be familiar with the recent research directions. In this study, a data mining was conducted on the catalyst articles published on 2008 indexed in website ISI. The all significant keywords were categorized in 11 groups by Refviz software ranging from ingredients and preparation approaches of catalysts to processes and industrial and scientific focus to them. The studies indicated a relative dominance of less-expensive approaches of synthesis and analysis, complexity of catalyst knowledge and restricting catalysts to energy and environmental market.

Keywords: Data mining, Catalyst, ISI Database, Thematic Categorizing, Refviz

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Performance of MFI Zeolite Membranes in the Separation of Linear and Nonlinear Hydrocarbons

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Abstract
Regarding to the importance of membrane technology in comparison with other separation processes, in this paper the used membranes characteristics and performance such as their permeability and selectivity in the separation of linear and nonlinear hydrocarbons were investigated. The most of used membranes for this purpose were inorganic MFI zeolite membranes, because the polymeric membranes showed slight performance in the separation of linear and nonlinear hydrocarbons. Due to the high performance of MFI-type membranes, the mechanism of linear and nonlinear hydrocarbons separation via this type of membranes was studied. Also, the effects of various metals presence in the MFI zeolite crystalline framework were considered to modify and improve this type of membranes separation performance. Regarding to the obtained results in the literature; among the substituted membranes, B-ZSM-5 membrane had the highest selectivity in the separation of linear and nonlinear hydrocarbons.

Keywords: Separation, Linear and Nonlinear Hydrocarbon, MFI Zeolite Membrane, Metals Substitution

Functionalization of Carbon Nanotubes and Their Applications in Treatment and Separation Processes: A Review

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Abstract
Since the last decade, researcher activities in the field of nano-materials have been considerably increased. Carbon nanotubes has exploited as efficient adsorbent for removal of heavy metals, macromoleculars and microorganism due to high length to diameter ratio, large accessible external surface area, and favorite reactivity. These materials are used in membrane processes in order to achieve high flux and selectivity. Adding CNT to photocatalysts increases the removal efficiency of pollutants. By functionalization of carbon nanotubes, their aggregations have suppressed in solutions. This leads efficiency improvement and uniform dispersion.

Keywords: Carbon Nanotubes, Separation, Treatment, Membrane, Adsorption, Functionalization

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Study on Absorbent Mixtures in Lithium Bromide Absorption Chillers

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Abstract
Lithium bromide aqueous solution is used as working fluid in absorption chillers because of low heat capacity as well as high water absorption capacity. However there are some difficulties such as salt crystallization and low efficiency. Usually mixtures of chemical additives and salt mixtures have been used to prevent the crystallization problems and increase the efficiency. In this paper, different types of absorption chillers have been reviewed; meanwhile the main effective parameters in the performance of lithium bromide absorption cycle have been studied. Considering different properties of Lithium Bromide and its limitations for application in absorption chillers, required additives that can be used in absorbent mixture has been investigated. In this work, previous experimental and researches on these mixtures have been studied and a collection of all the suggested additives by researchers has been presented comparing Lithium Bromide (without additives).

Keywords: Lithium Bromide, Absorption Chiller, Efficiency, Absorbent Mixture

Biosorption of Cd (II) from Aqueous Solution by *Fucus Serratus*: Surface Characterization and Sorption Mechanisms

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Abstract
One of the toxic element cadmium is environmentally and through water, air and food into the body and be associated with Metallothionein accumulated in the kidneys, causing disturbance in the body are normal activities. In this work, the brown alga (Fucus serratus) used as a low cost sorbent has been studied for the biosorption of Cadmium (II) ions in batch reactors. Cadmium ions adsorption by the biosorbents on tap was selected for high efficiency. In this research it became clear that a key role in the uptake of cadmium ions alginate surface active groups, especially carboxyl foundations are responsible. Firstly, the characterization of the surface functional groups was performed with the method, a qualitatively analysis with the study of FT-IR spectrum. The equilibrium time was about 3. 0 min and the adsorption equilibrium data were well described by the Langmuir's equation. The maximum capacity has been extrapolated to 0/85 mmol. g^{-1}. Finally; the efficiency of this biosorbent in natural tap water for the removal of cadmium was also investigated.

Keywords: Biosorption, Brown Algae, Ion Exchange Capacity, Cadmium

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Simulation of Complex and Dry Reforming of Natural Gas for Synthesis Gas Production and their Comparison

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Abstract
In this study, two units of production of synthesis gas has been stimulated into 2 forms of natural gas complex reforming and dry reforming .they have been examined from technical and economical views . The product from this process is synthesis gas by the unit ratio of Hydrogen and Carbon Monoxide (H_2/CO =1) which is used in Arak petrochemical complex for producing 2EH. For producing this synthesis gas in 900℃ (reactor temperature) and 15 bar of total pressure, the ratio of feeding parts into reforming reactor for total input carbon (methane and other hydrocarbon) and Carbon dioxide gas and water vapor in representation [CH_4 + equivalent carbon in other hydrocarbons: CO_2: H_2O] for complex reforming equals [1: 2.5: 2.15] , and for dry reforming equals [1: 1: 0.33]. The Result of mentioned simulation clarifies the percentage of saving fuel gas, Electrical Energy, water and Carbon dioxide in dry reforming to complex reforming. In this study, operational conditions and costs of energy and materials are the same real costs in production unit of synthesis gas in Arak petrochemical complex. By comparing the results out of the two simulated units it is shown that the total operational costs of the current unit will decrease more than twice in case of changing to dry reforming.

Keywords: Complex Reforming, Dry Reforming, Synthesis Gas

Optimum Selection of Artificial Lift in one of Offshore Oil Fields Located in Persian Gulf

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Abstract
The artificial lift methods are widely used for which oil fields can not produce oil naturally.
The oil field under study is naturally producing at the moment, but due to pressure loss and increasing water cut, oil production has been decreased. So it is necessary to use an artificial lift technique for this oil field in future. To select the optimum artificial lift system, 6 artificial lift methods are compared together and currently artificial lift techniques in Iranian oil field are studied and reviewed. Then the gas lift is simulated for one of wells. At last, upon the comparison and simulation for this field, the gas lift is offered as the optimum artificial lift method.

Keywords: Oil Reservoir, Artificial Lift, Water Cut, Gas Lift

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Modeling of Catalytic Coke Rate in the Presence of H_2S in the Thermal Cracking of Ethane

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Abstract
Generally, during the thermal cracking of hydrocarbons, carbon (coke) are formed either on the wall of the reactor or in the gas phase. Coke formation is an unwelcome and undesirable product . Hence, the sulfur compounds usually are used as an additive in order to prevent coke formation and CO production. The most important mechanism in the coke formation in the thermal cracking of hydrocarbons, is the catalytic mechanism. In this work, catalytic coking mechanism in the presence of H2S in the thermal cracking of ethane has been investigated. The coke rate equations has been proposed by suggested mechanisms. The rate coefficients for these models were determined using non-linear Marquardt-Levenberg optimization. The sum of squares of the deviations between the calculated and experimental data was used as the objective function and minimized. Finally, the experimental and calculated data were compared and one of the mechanisms agrees with the experimental data in a better accuracy.

Keywords: Thermal Cracking, Catalytic Coke Mechanism, Rate Coefficient, The Sum of Squares of the Deviations

Introduction of Solvent Sublation: An Effective Method for the Removal and Preconcentration of Organic and Inorganic Compounds

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Abstract

Solvent sublation is one of the non-foaming adsorptive bubble separation techniques for the removal of hydrophobic compounds from dilute aqueous solutions, in which surface-active compounds are adsorbed on the surface of rising bubbles and then are extracted into an immiscible organic layer placed on the top of the aqueous phase. This paper aims to review mass transport mechanisms, proposed mathematical models and the effects of some important parameters on the performance of this process. At the end, a number of conducted studies have been mentioned briefly in the removal of organic compounds and also preconcentration of trace metal ions in aqueous solutions.

Keywords: **Solvent Sublation, Adsorptive Bubble Separation Technique, Dilute Aqueous Solutions, Mathematical Model**